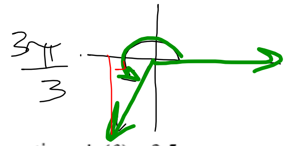
Preview

HW Questions from last Friday's assignment: 7 - # 90 --->98

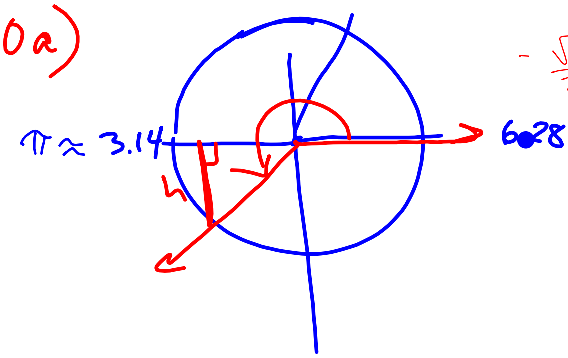
7-90. Calculate the value of each expression below. Give an exact measurement, if possible. Each measure is given in radians.

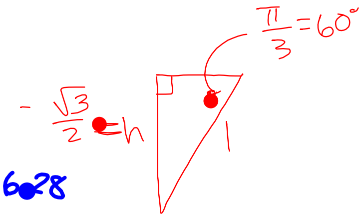
a. $\sin(4)$ ≈ -0.76 b. $\sin(\frac{4\pi}{3})$ $= -\frac{\sqrt{3}}{2}$



7-91. Find the exact values of the angles that are solutions to the equation $\sin(\theta) = 0.5$. Express your solutions in radians.

90a)





Preview

7-90. Calculate the value of each expression below. Give an exact measurement, if possible. Each measure is given in radians.

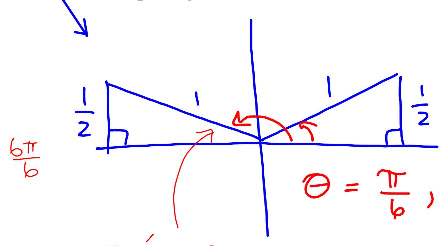
a. $\sin(4)$ b. $\sin(\frac{4\pi}{3})$

$30° - 360°$

$\sin(-330°)$

7-91 Find the exact values of the angles that are solutions to the equation $\sin(\theta) = 0.5$. Express your solutions in radians.

$\frac{\pi}{6} = 30°$



$\sin 30° = \frac{1}{2}$

$\theta = \frac{\pi}{6}, \frac{5\pi}{6}$

$\sin 390° = \frac{1}{2}$

$\theta' = \frac{\pi}{6}$

$\frac{\pi}{6} + 2\pi n$; where n = integer

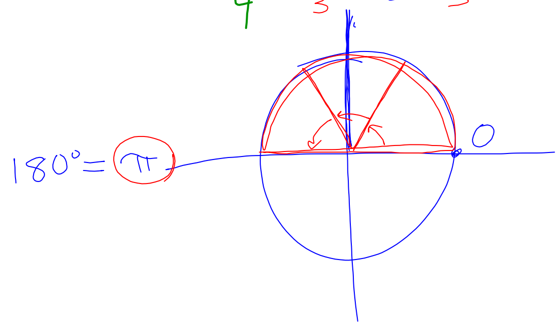
$\frac{5\pi}{6} + 2\pi n$;

7-92. You have seen that you can calculate values of the sine function using right triangles formed by a radius of the unit circle. Values of θ that result in $30°-60°-90°$ or $45°-45°-90°$ triangles are used frequently on exercises and tests because their sine and cosine values can be found exactly, without using a calculator. You should learn to recognize these values quickly and easily. The same is true for values of $\cos\theta$ and $\sin\theta$ that correspond to the x- and y-intercepts of the unit circle.

The central angles that correspond to these "special" values of x are 30°, 45°, 60°, 90°, 120°, 135°, 150°, 180°, 210°, 225°, 240°, 270°, 300°, 315°, and 330°. What these angles have in common is that they are all multiples of 30° or 45°, and some of them are also multiples of 60° or 90°.

Copy and complete a table like the one below for all special angles between 0° and 360°.

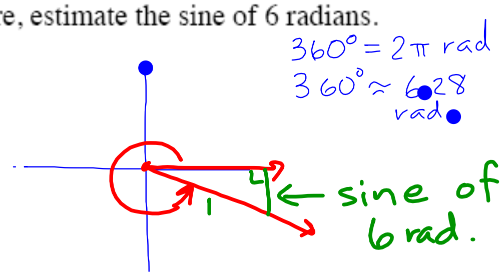
Degrees	0	30	45	60	90	120		
Radians	0	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$	$\frac{2\pi}{3}$		



7-93. Draw a picture of an angle that measures 6 radians.

a. Approximately how many degrees is this?

b. Using only your picture, estimate the sine of 6 radians.



7-94. Evaluate each expression without using a calculator or changing the form of the expression.

a. log(10)

b. $\log(\sqrt{10})$

c. log(0)

d. $10^{(2/3)\log(27)}$

Think: "What exponent on the base 10 would give you $\sqrt{10}$?"

operations undo each other

$10^{\log_{10}(27)^{2/3}}$

7-95. What interest rate (compounded annually) would you need to earn in order to double your investment in 15 years?

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7-95. What interest rate (compounded annually) would you need to earn in order to double your investment in 15 years?

$$\frac{2\cancel{P}}{\cancel{P}} = \frac{\cancel{P}(1+r)^{15}}{\cancel{P}}$$

$$2 = (1+r)^{15}$$

$$\sqrt[15]{2} = 1 + r$$

$$r = \sqrt[15]{2} - 1$$

$$r \approx 0.0473$$

$\approx 4.73\%$

7-96. Angle A is an obtuse angle with a sine of $\frac{3}{10}$. What is the tangent of angle A?

$\sin A = \frac{3}{10}$

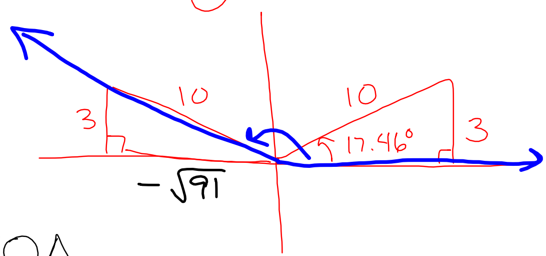
SOH

$A = \sin^{-1}\left(\frac{3}{10}\right) \approx 17.46^\circ$

def. obtuse

$\theta' \approx 17.46^\circ$

$90^\circ < \theta < 180^\circ$



TOA

$\tan A = \frac{3}{-\sqrt{91}} \cdot \frac{\sqrt{91}}{\sqrt{91}}$

$= -\frac{3\sqrt{91}}{91}$

7-97. Find the inverse functions for the functions given below.

a. $f(x) = \sqrt[3]{4x-1}$

b. $g(x) = \log_7 x$

$x = \log_7 y$

$7^x = y$

7-98. Solve each of the following equations.

a. $2(x-1)^2 = 18$

b. $2^x + 3 = 10$

Classwork Week 10

7 - #86 --->89 (with unit circle resource page)

Salmon WS (non- test takers)

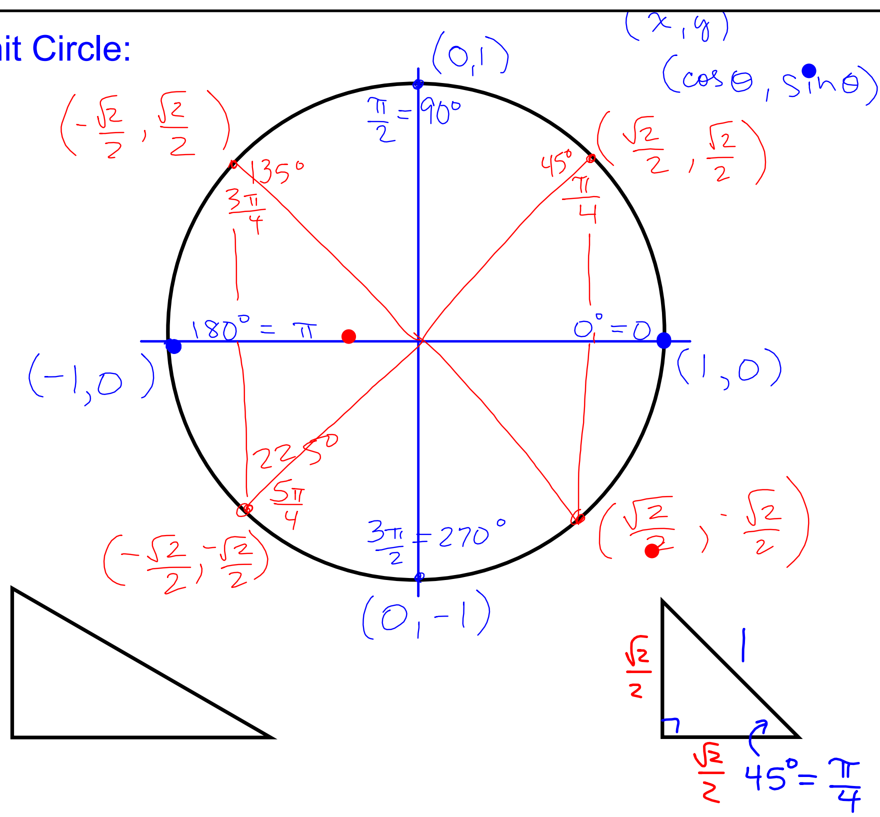
Checkpoint 6B, # 1 - 20

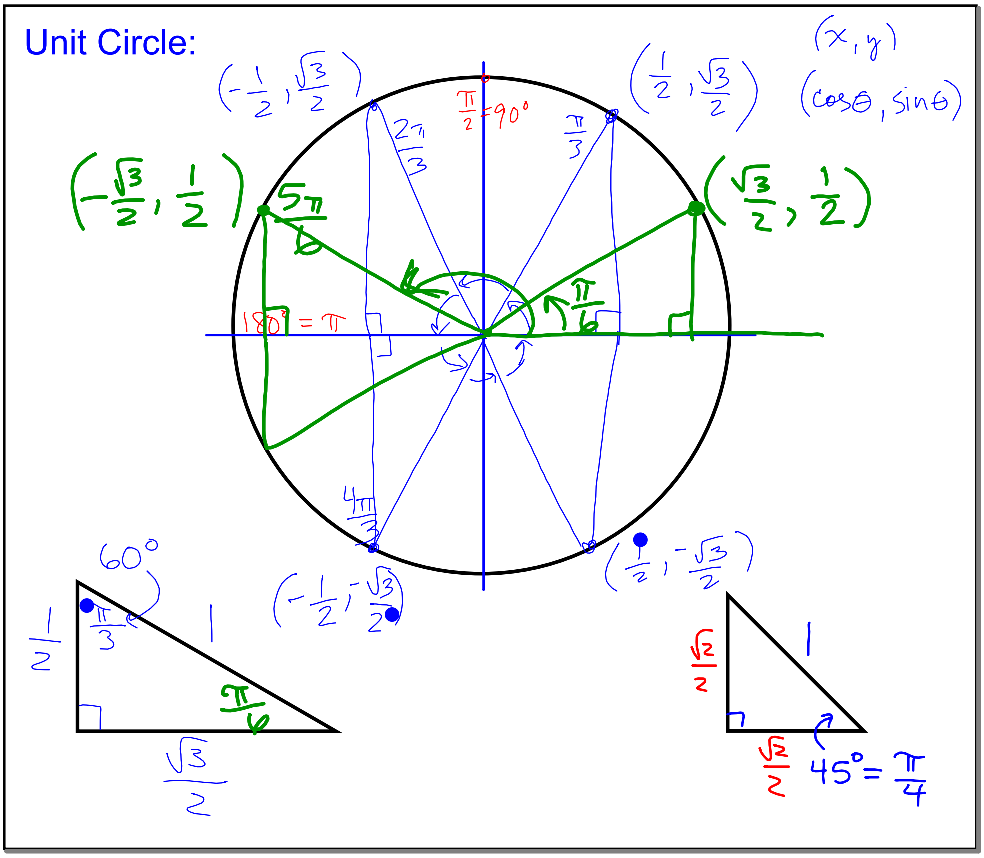
Homework for T - Th:

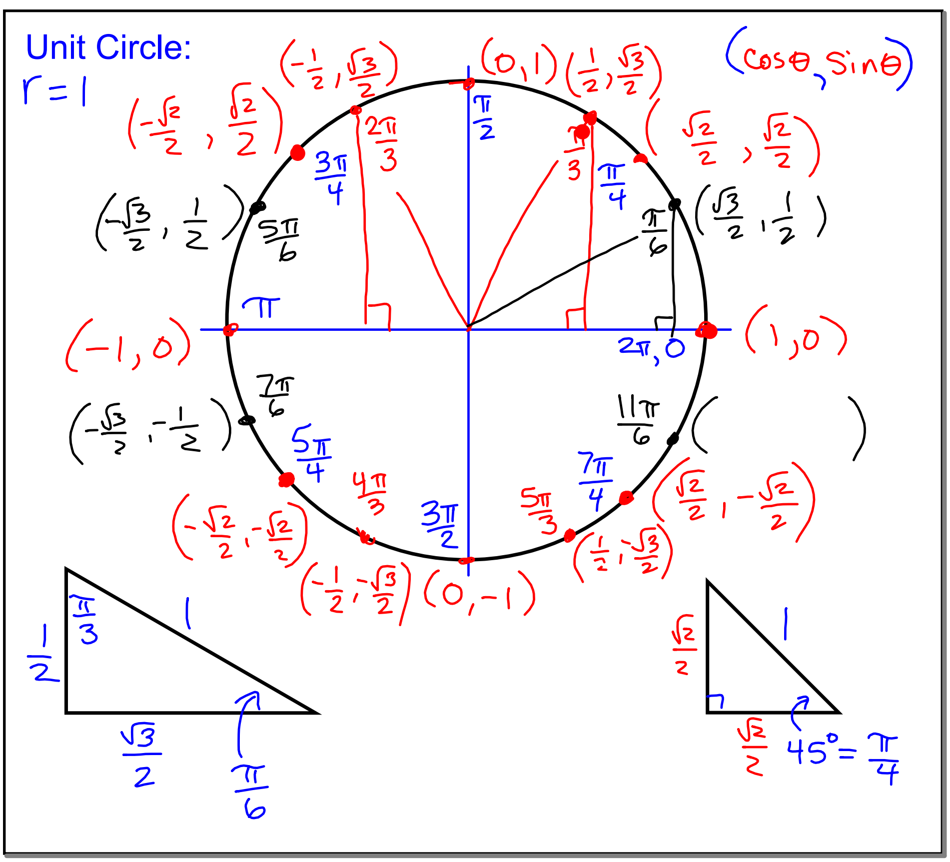
Tan & Yellow worksheets

Checkpoint 8B, # 1 - 20

Unit Circle:




Unit Circle:
(x, y)
(cosθ, sinθ)
π/2 = 90°
180° = π
60°
45° = π/4


Unit Circle:
r = 1
(cosθ, sinθ)
(0, 1)
(1, 0)
(−1, 0)
(0, −1)
45° = π/4

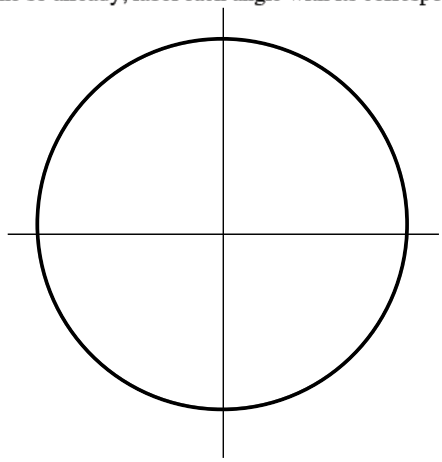
CP's from last Friday:

7-87. Now you will build a unit circle. Obtain the Lesson 7.1.6 Resource Page from your teacher. There are points shown at $\frac{\pi}{12}$, $\frac{\pi}{6}$, $\frac{\pi}{4}$, $\frac{\pi}{3}$, $\frac{5\pi}{12}$, $\frac{7\pi}{12}$, $\frac{2\pi}{3}$, $\frac{3\pi}{4}$, $\frac{5\pi}{6}$, and $\frac{11\pi}{12}$ units along the circle, starting from the positive x-axis.

a. Find and label the exact coordinates, in (x, y) form, for three of the points shown in the *first quadrant*.

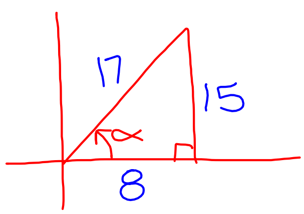
b. Mark *all* other points in the unit circle for which you can find *exact* coordinates. Not all of them are shown. Label each of these points with its angle of rotation (in radians) and its coordinates.

c. If you have not done so already, label each angle with its corresponding radian measure.

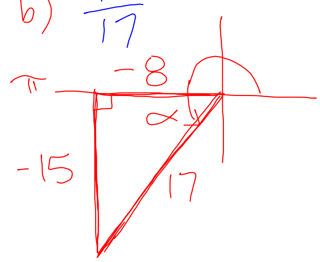


7-89. For angle α in the first quadrant, $\cos\alpha = \frac{8}{17}$. Use that information to find each of the following values without using a calculator. Be prepared to share your strategies with the class.

a. $\sin\alpha$ b. $\sin(\pi + \alpha)$ c. $\cos(2\pi - \alpha)$

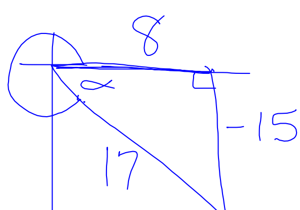


b) $-\frac{15}{17}$



a) $\sin\alpha = \frac{15}{17}$

c)



$\cos(2\pi - \alpha) = \frac{8}{17}$

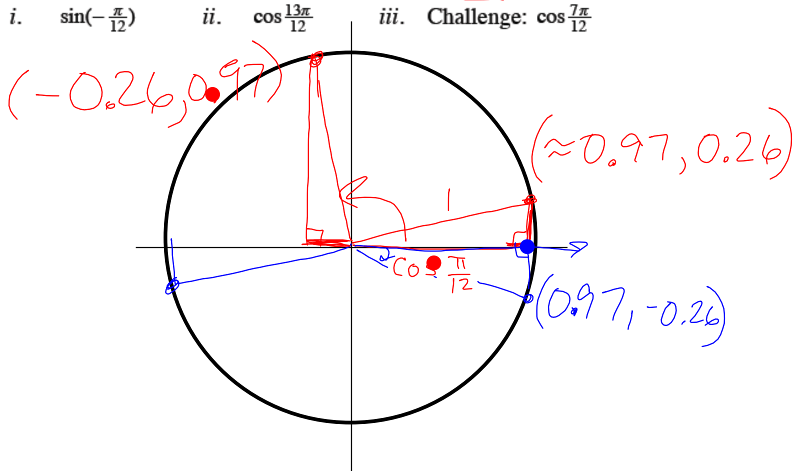
7-88. Draw a new unit circle, label a point that corresponds to a rotation of $\frac{\pi}{12}$, and put your calculator in radian mode.

a. What are the coordinates of this point, correct to two decimal places?

b. Use the information you found in part (a) to determine each of the following values: (Hint: Drawing each angle on the unit circle will be very helpful.)

i. $\sin(-\frac{\pi}{12})$ *ii.* $\cos\frac{13\pi}{12}$ *iii.* Challenge: $\cos\frac{7\pi}{12}$

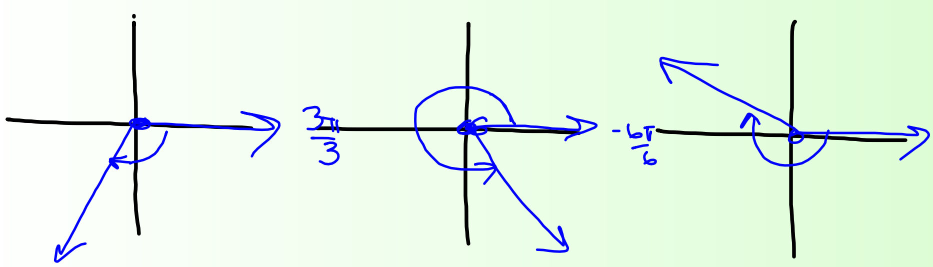
11



Draw each angle in Standard Position:

Start at the positive x-axis

1) -120° 2) $\frac{5\pi}{3}$ 3) $-\frac{7\pi}{6}$



Negative angles rotate down from the positive x-axis

HW: 7.1.6 Homework WS

(Green)

Short Quiz Tuesday:
Solving Quadratics all three ways.
Changing Radians <---> Degrees.
Solving a Radical Equation

EC: Something from the Unit Circle